



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,321	01/26/2004	Artur Hogele	03014	7518

7590 11/23/2005

Walter Ottesen  
Patent Attorney  
P.O. Box 4026  
Gaithersburg, MD 20885-4026

EXAMINER
----------

SCHWARTZ, JORDAN MARC

ART UNIT	PAPER NUMBER
----------	--------------

2873

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/763,321

Applicant(s)

HOGELE ET AL.

Examiner

Jordan M. Schwartz

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 13-20 and 31 is/are allowed.  
6) ☒ Claim(s) 1-3,5-12,21-23,25-28,30,32 and 33 is/are rejected.  
7) ☒ Claim(s) 4,24 and 29 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

The amendment filed August 11, 2005 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: specifically, the insert to page 1, line 20 and to page 3 line 14 changes the reference from patent publication number 2001/0019404 to U.S. patent number 6,822,729. However, publication number 2001/0019404 does not correspond to U.S. patent number 6,822,729 but instead corresponds to U.S. patent number 6,930,758. Therefore, now stating that patent number 6,822,729 is incorporated by reference introduces prohibited new matter. It is suggested that applicant change the references of patent number 6,822,729 to patent number 6,930,758 to overcome this new matter objection.

Applicant is required to cancel the new matter or amend the specification as suggested above in the reply to this Office Action.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2873

Claims 1-3, 6-7, 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by McGuire, Jr publication number 2004/0036985.

McGuire, Jr reads on these claims by disclosing the limitations therein including the following: an optical arrangement including a light source for generating a light beam along the optical axis (abstract, Figures 1 and 11); the light of the beam being polarized tangentially or radially to the optical axis (paragraphs 0029-0030, 0088); a light source with the light of the light beam having a wavelength of 157nm or 193 nm (paragraphs 0088 and 0180); an optical element made of a single-axis double refracting crystalline material (abstract, paragraphs 0008, 0019, 0030, 0068, 0070, 0132 i.e. will inherently be double refracting since the element is being made of MgF<sub>2</sub> or CaF<sub>2</sub> crystal similar to that of the claimed invention); the optical crystal axis being aligned parallel to the optical axis (paragraphs 0118, 0149). The optical arrangement will inherently have a plane i.e. an infinite number of planes perpendicular to the optical axis and therefore the crystal lenses can inherently be considered mounted next to one of these planes. McGuire, Jr. further discloses the crystalline material as MgF<sub>2</sub> (paragraphs 0070, 0132-0133); the plane as a pupillary plane (Figures 1 and 11, paragraph 0084 and see examples of Tables I and IV); the optical arrangement made of a second crystal material different from the first crystal material (paragraph 0084 re "most or even all of the cubic crystalline optical elements are formed of the same cubic crystalline material" and "most or even all" implies that some may be formed of different crystalline material); a microlithographic projection exposure system (paragraphs 0003, 0014-0033); a UV light source for generating a light beam having a wavelength of 157nm or 193 nm

Art Unit: 2873

(paragraphs 0015, 0080, 0180); an illumination systems downstream of the light source (paragraph 0016); and the single-axis double refracting material within a projection objective (Figures 1 and 11, paragraph 0017).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-9, 21-23, 26-28, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire Jr. publication number 2004/0036985.

McGuire, Jr discloses as is set forth above but does not specifically disclose the first material as MgF<sub>2</sub> and the second material as CaF<sub>2</sub> or BaF<sub>2</sub>. However, McGuire, Jr teaches that the optical system can have two different types of crystal materials (paragraph 0084) and further discloses that the crystal materials can be selected from MgF<sub>2</sub> or CaF<sub>2</sub> or BaF<sub>2</sub> for the purpose of providing the required aberration reduction within the lens system (paragraphs 0003-0013 and 0084). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the crystal optical element of McGuire, Jr. as a lens made of MgF<sub>2</sub> material and the second crystal material as either CaF<sub>2</sub> or BaF<sub>2</sub> since McGuire, Jr teaches that the optical system can have two different types of crystal materials and further discloses that the crystal materials can be selected from MgF<sub>2</sub> or CaF<sub>2</sub> or BaF<sub>2</sub> for the purpose of providing the required aberration reduction within the lens system.

Claims 1-3, 6, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerhard publication number 2004/0240073 in view of Schuster'498.

Gerhard discloses the limitations therein including the following: an optical arrangement including a light source for generating a light beam along the optical axis (Figure 1, "1", paragraph 0018); the light of the beam being polarized radially to the optical axis (Figure 1, "5", paragraph 0019); the light of the light beam having a wavelength of 157nm or 193 nm (paragraph 0011 and 0014); an optical element made of a single-axis double refracting crystalline material (Figure 2, "14", paragraph 0021 i.e. will inherently be double refracting since the element is being made of MgF<sub>2</sub> crystal similar to that of the claimed invention); the optical crystal axis being aligned parallel to the optical axis (paragraph 0021). The optical arrangement will inherently have a plane i.e. an infinite number of planes perpendicular to the optical axis and therefore optical element "14" can inherently be considered mounted next to one of these planes.

Gerhard further discloses a UV light source (paragraph 0018); an illumination system downstream of the light source (either "4" or "6" or "7" of Figure 1); and the single-axis double refracting material within a projection objective (Figure 2, paragraph 0021).

Gerhard discloses as is set forth above but does not specifically disclose the optical element of MgF<sub>2</sub> as a lens. Schuster'498 teaches that when a single-axis double refracting crystal material is being used within an optical element of a projection lens system, that the optical element can be in the form of a lens of MgF<sub>2</sub> to provide additional desired refraction of the light (column 1, lines 9-60). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made

Art Unit: 2873

to have the crystal optical element of Gerhard as a lens made of MgF<sub>2</sub> material since Schuster'498 teaches that when a single-axis double refracting crystal material is being used within an optical element of a projection lens system, that the optical element can be in the form of a lens of MgF<sub>2</sub> to provide additional desired refraction of the light.

Gerhard further discloses the optical element arranged next to a pupillary plane (paragraph 0023); and a second lens made of a different material (paragraph 0020 i.e. any of the lenses of Figure 2).

Claims 1-2, 6, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Totzeck publication number 2004/0184019 in view of Schuster'498.

Totzeck discloses the limitations therein including the following: an optical arrangement including a light source for generating a light beam along the optical axis (Figure 1, paragraph 0056); the light of the beam being polarized radially to the optical axis (claim 21); the light of the light beam having a wavelength of 157nm or 193 nm (paragraph 0037); an optical element made of a single-axis double refracting crystalline material (paragraph 0071 i.e. will inherently be double refracting since the element is disclosed as birefringent); the optical crystal axis being aligned parallel to the optical axis (paragraph 0071). The optical arrangement will inherently have a plane i.e. an infinite number of planes perpendicular to the optical axis and therefore optical element "30" can inherently be considered mounted next to one of these planes. Totzeck further discloses a UV light source (paragraph 0056); an illumination system downstream of the light source (Figure 1, "4", paragraph 0056); and the single-axis double refracting material within a projection objective (paragraph 0056). Totzeck discloses as is set forth

Art Unit: 2873

above but does not specifically disclose the optical element as a lens. Schuster'498 teaches that when a single-axis double refracting crystal material is being used within an optical element of a projection lens system, that the optical element can be in the form of a lens to provide additional desired refraction of the light (column 1, lines 9-60). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the crystal optical element of Totzeck as a lens since Schuster'498 teaches that when a single-axis double refracting crystal material is being used within an optical element of a projection lens system, that the optical element can be in the form of a lens to provide additional desired refraction of the light. Totzeck further discloses the optical material as MgF<sub>2</sub> (paragraph 0105); and a second lens made of a different material (any of the lenses of Figure 1).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGuire Jr. publication number 2004/0036985 in view of Steffens patent number 6,856,642.

McGuire Jr. discloses and teaches as is set forth above including the light source as a laser and the light being polarized radially or tangentially as set forth above but does not specifically disclose a resonator to couple out the radially or tangentially polarized light. Steffens teaches that when using a laser light source and changing the polarization state of the light, it is desirable to use a resonator as a coupling device for the purpose of coupling the polarized light into a desired path. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the optical system of McGuire Jr. as further comprising a resonator to couple the polarized light since Steffens teaches that when using a laser light source and



Art Unit: 2873

changing the polarization state of the light, it is desirable to use a resonator as a coupling device for the purpose of coupling the polarized light into a desired path.

***Allowable Subject Matter***

The indicated allowability of claims 21-23, 25-28, 30, and 32-33 is withdrawn in view of the newly discovered reference(s) to McGuire Jr. Rejections based on the newly cited reference are set forth above.

Claims 4, 24, and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 13-20 and 31 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: with respect to the allowable subject matter, none of the prior art either alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103. Specifically, with reference to claims 4, 13-20, 24, 29, and 31, none of the prior art either alone or in combination, disclose or teach of the claimed optical arrangement or microlithographic projection exposure system specifically including, as the distinguishing feature in combination with the other limitations, the claimed lens made of a single-axis, double refracting crystalline material with the lens taking up the light beam with a numerical aperture of up to 0.1.

***Response to Arguments***

Applicant's arguments filed August 8, 2005 have been considered. With respect to the 102 rejection by Schuster'498 and based upon applicant's amendment, the

Art Unit: 2873

arguments are persuasive and therefore this rejection has been withdrawn. However, with respect to the 103 rejections by Gerhard in view of Schuster'498 and Totzeck in view of Schuster'498 they are not persuasive. Furthermore, the newly discovered reference to McGuire Jr is applicable to a number of the claims as set forth in the rejections above. Due to the applicability of the McGuire Jr reference to claims previously indicated as allowable, this action is being made non-final.

Applicant has amended independent claims 1 and 10 to further claim the light beam having a wavelength of 157nm or 193nm. As set forth in the rejections above, the main references of Gerhard and Totzeck each disclose the light source as a laser having a wavelength of 157 nm or 193 nm. Applicant argues that a person of ordinary skill in the art would not consider combining Schuster'498 with any of the teachings set forth in Gerhard or Totzeck, however, the examiner disagrees. Gerhard and Totzeck are not being used as teaching references but are the main references in the 103 rejections. Gerhard and Totzeck both disclose using a single axis double refracting crystalline optical element made of MgF<sub>2</sub> within a projection lens system but do not specifically disclose this optical element as a lens. Schuster'498 teaches that when using a single axis double refracting crystalline optical element made of MgF<sub>2</sub> within a projection lens system that the element can be in the form of a lens to provide additional desired refraction of the light. The examiner believes that based upon the similarities of the optical systems, one of ordinary skill in the art would consider combining either Gerhard with Schuster'498 or Totzeck with Schuster'498.

Art Unit: 2873

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jordan M. Schwartz whose telephone number is (571) 272-2337. The examiner can normally be reached on Monday to Friday from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'J. M. Schwartz', with a stylized flourish at the end.

Jordan M. Schwartz  
Primary Examiner  
Art Unit 2873  
November 22, 2005